

*CHE*

United States Patent [19]  
Johnson

[11] Patent Number: 4,575,373  
[45] Date of Patent: Mar. 11, 1986

[54] LASER ADJUSTABLE INTRAOCULAR LENS  
AND METHOD OF ALTERING LENS  
POWER

[76] Inventor: Don R. Johnson, 9131 Piscataway  
Rd., Clinton, Md. 20735

[21] Appl. No: 667,648

[22] Filed: Nov. 2, 1984

[51] Int. Cl.<sup>4</sup> ..... A61F 2/16

[52] U.S. Cl. ..... 623/6

[58] Field of Search ..... 3/13; 128/303.1;  
351/160 R, 176

[56] References Cited

U.S. PATENT DOCUMENTS

4,253,199 3/1981 Banko ..... 3/13  
4,373,218 2/1983 Schachar ..... 3/13

4,461,294 7/1984 Baron ..... 128/303.1

Primary Examiner—Richard J. Apley

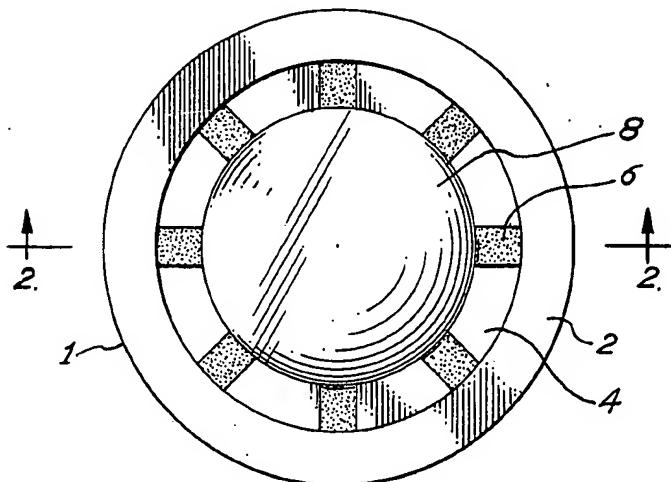
Assistant Examiner—James Prizant

Attorney, Agent, or Firm—Allegretti, Newitt, Witcoff &  
McAndrews, Ltd.

[57] ABSTRACT

A laser beam is utilized to alter, in situ, the power of an implanted intraocular lens. The overall intraocular lens can be of conventional size and shape. The circumference, or outer ring of the lens is manufactured from a non-toxic heat shrinkable plastic. The plastic is preferably colored to permit selective absorption of laser energy thereby causing the shape, and thus the corrective power, of the lens to change. The invention is particularly useful for correcting postoperative astigmatism.

12 Claims, 4 Drawing Figures



*CJF*  
United States Patent [19]

Peyman

[11] Patent Number: 4,685,922

[45] Date of Patent: Aug. 11, 1987

[54] ALTERABLE REFRACTIVE POWER  
INTRAOCULAR LENSES

[76] Inventor: Gholam A. Peyman, 535 N. Michigan Ave., Apt. 3001, Chicago, Ill. 60611

[21] Appl. No.: 878,368

[22] Filed: Jun. 25, 1986

[51] Int. Cl.<sup>4</sup> ..... A61F 2/16

[52] U.S. Cl. ..... 623/6

[58] Field of Search ..... 623/6

[56] References Cited

U.S. PATENT DOCUMENTS

- |           |        |          |       |       |
|-----------|--------|----------|-------|-------|
| 4,253,199 | 3/1981 | Banko    | ..... | 623/6 |
| 4,373,218 | 2/1983 | Schachar | ..... | 623/6 |
| 4,573,998 | 3/1986 | Mazzocco | ..... | 623/6 |
| 4,585,457 | 4/1986 | Kalb     | ..... | 623/6 |

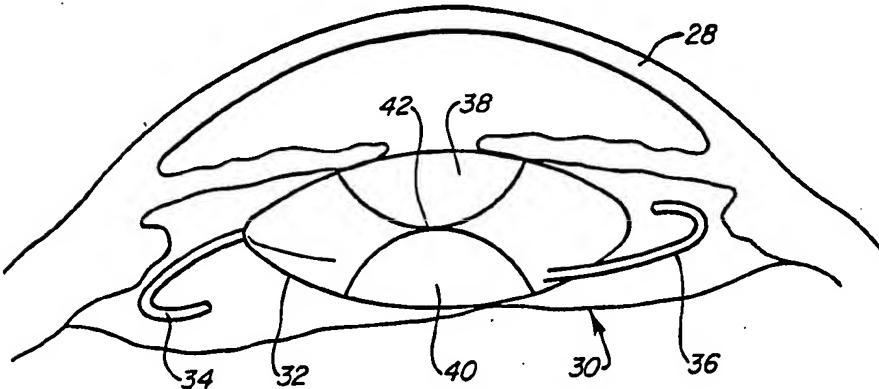
Primary Examiner—Ronald L. Frinks  
Attorney, Agent, or Firm—Thomas A. Kmiotek

[57] ABSTRACT

Disclosed are intraocular lenses where the refractive power is fixed at implantation while offering the benefit of changing the refractive power subsequently with little or no surgical invasion and in a nearly atraumatic manner. The intraocular lenses are comprised of a central lenticular portion having a chamber therein and having at least one refractive, rupturable membrane which can be ruptured subsequent to implantation thus changing the refractive power of the lenses. The intraocular lenses can be implanted in either the posterior chamber or capsular bag.

14 Claims, 7 Drawing Figures

*CJF*  
—  
*cap. bag*



*CJH*  
United States Patent [19]

Deacon et al.



US005571177A

[11] Patent Number: 5,571,177  
[45] Date of Patent: Nov. 5, 1996

[54] IOL STRUCTURED FOR POST-OPERATIVE RE-POSITIONING AND METHOD FOR POST-OPERATIVE IOL RE-POSITIONING

[75] Inventors: Jim Deacon, Capistrano Beach; Glenn R. Sussman, Lake Forest; Joseph I. Weinschenk, III, Laguna Niguel, all of Calif.

[73] Assignee: Allergan, Irvine, Calif.

[21] Appl. No.: 77,810

[22] Filed: Jun. 14, 1993

[51] Int. Cl.<sup>6</sup> A61F 2/16

[52] U.S. Cl. 623/6

[58] Field of Search 623/6

[56] References Cited

U.S. PATENT DOCUMENTS

4,134,161	1/1979	Bayers	623/6
4,136,466	1/1979	Wrue	
4,219,721	8/1980	Kamen et al.	
4,403,354	9/1983	Rainin	623/6
4,435,855	3/1984	Pannu	623/6
4,443,441	4/1984	Galin	
4,463,457	8/1984	Kelman	623/6
4,575,373	3/1986	Johnson	623/6
4,585,456	4/1986	Blackmore	623/6
4,617,023	10/1986	Peyman	623/6
4,642,113	2/1987	Dubroff	623/6
4,661,109	4/1987	White	623/6
4,662,882	5/1987	Hoffer	623/6
4,666,445	5/1987	Tilly	623/6
4,676,793	6/1987	Bechert, II	623/6
4,681,585	7/1987	Sayano et al.	623/6
4,685,921	8/1987	Peyman	623/6
4,685,922	8/1987	Peyman	623/6
4,781,718	11/1988	Lindstrom	623/6
4,834,753	5/1989	Sulc et al.	623/6
4,872,876	10/1989	Smith	623/6
4,946,470	8/1990	Sulc et al.	623/6
5,108,429	4/1992	Wiley	623/6
5,147,395	9/1992	Willis	623/6
5,269,813	12/1993	Yoshida et al.	623/6
5,288,293	2/1994	O'Donnell, Jr.	623/6

FOREIGN PATENT DOCUMENTS

0094158	11/1983	European Pat. Off.	.
478929	11/1983	European Pat. Off.	.
0278724	8/1988	European Pat. Off.	.
0336318	10/1989	European Pat. Off.	.
1424828	9/1988	U.S.S.R.	.
WO8701931	4/1987	WIPO	.
9007914	7/1990	WIPO	623/6

OTHER PUBLICATIONS

Friedberg et al, A new technique for repositioning and fixating a dislocated intraocular lens, Arch Ophthalmol, Mar. 1992, 110 (3) pp. 413-415 Abstract Only.

Chan, An improved technique for management of dislocated posterior chamber implants, Ophthalmology, Jan. 1992, 99 (1) pp. 51-57 Abstract Only.

Bowman et al, Noninvasive repositioning of a posterior chamber intraocular lens following pupillary capture, J Cataract Refract Surg, Nov. 1991, 17 (6) pp. 843-847 Abstract Only.

Flynn et al, Management of subluxated and posteriorly dislocated intraocular lenses using pars plana vitrectomy instrumentation, J Cataract Refract Surg, Jan. 1990, 16 (1) pp. 51-56 Abstract Only.

Smiddy, Dislocated posterior chamber intraocular lens. A new technique of management, Arch Ophthalmol, Nov. 1989, 107 (11) pp. 1678-1680 Abstract Only.

Neumann et al, Complications associated with STAAR silicone implants, J Cataract Refract Surg, Nov. 1987, 13 (6) pp. 653-656 Abstract Only.

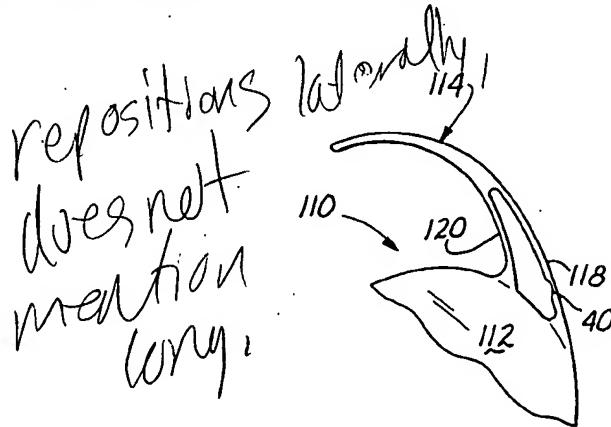
(List continued on next page.)

Primary Examiner—Mary Beth Jones  
Attorney, Agent, or Firm—Frank J. Uxa

[57] ABSTRACT

A new intraocular lens (IOL) is disclosed. In one embodiment, this IOL comprises an optic and, secured to the optic, a fixation member including at least one alterable portion structured to be altered after the intraocular lens is placed in an eye to at least assist in controllably repositioning the optic in the eye.

13 Claims, 2 Drawing Sheets



does not mention capsular bag allows alteration of changing power

Citr



US006413277B1

(12) United States Patent  
Neuhann

(10) Patent No.: US 6,413,277 B1  
(45) Date of Patent: Jul. 2, 2002

(54) METHOD FOR INTRAOCULAR LENS  
INSERTION AND APPARATUS

(76) Inventor: Tobias H. Neuhann, Clemensstrasse  
94, Munich (DE), 80331

(\*) Notice: Subject to any disclaimer, the term of this  
patent is extended or adjusted under 35  
U.S.C. 154(b) by 0 days.

(21) Appl. No.: 09/574,151

(22) Filed: May 18, 2000

(51) Int. Cl.<sup>7</sup> A61F 2/16

(52) U.S. Cl. 623/6.39; 623/6.11; 623/6.38;  
623/6.41; 623/6.43

(58) Field of Search 623/5.12, 6.11,  
623/6.14, 6.38, 6.39, 6.4, 6.41, 6.42, 6.43,  
6.44, 6.45, 6.51

(56) References Cited

U.S. PATENT DOCUMENTS

- |             |   |        |            |         |
|-------------|---|--------|------------|---------|
| 4,113,088 A | * | 9/1978 | Blinkhorst | 206/210 |
| 4,280,232 A | * | 7/1981 | Hummel     | 623/6   |
| 4,446,581 A | * | 5/1984 | Blake      | 623/6   |
| 4,542,540 A | * | 9/1985 | White      |         |
| 4,726,367 A | * | 2/1988 | Shoemaker  | 128/303 |
| 5,047,051 A | * | 9/1991 | Cumming    | 623/6   |

5,766,244 A 6/1998 Binder  
5,824,074 A 10/1998 Koch  
5,843,184 A 12/1998 Clonni  
5,919,230 A 7/1999 Sambursky  
2001/0004708 A1 \* 6/2001 Nagai ..... 623/4.1

FOREIGN PATENT DOCUMENTS

EP	0884030	12/1998
EP	0 884 031	12/1998
EP	0968727	1/2000

\* cited by examiner

Primary Examiner—Paul B. Prebilic

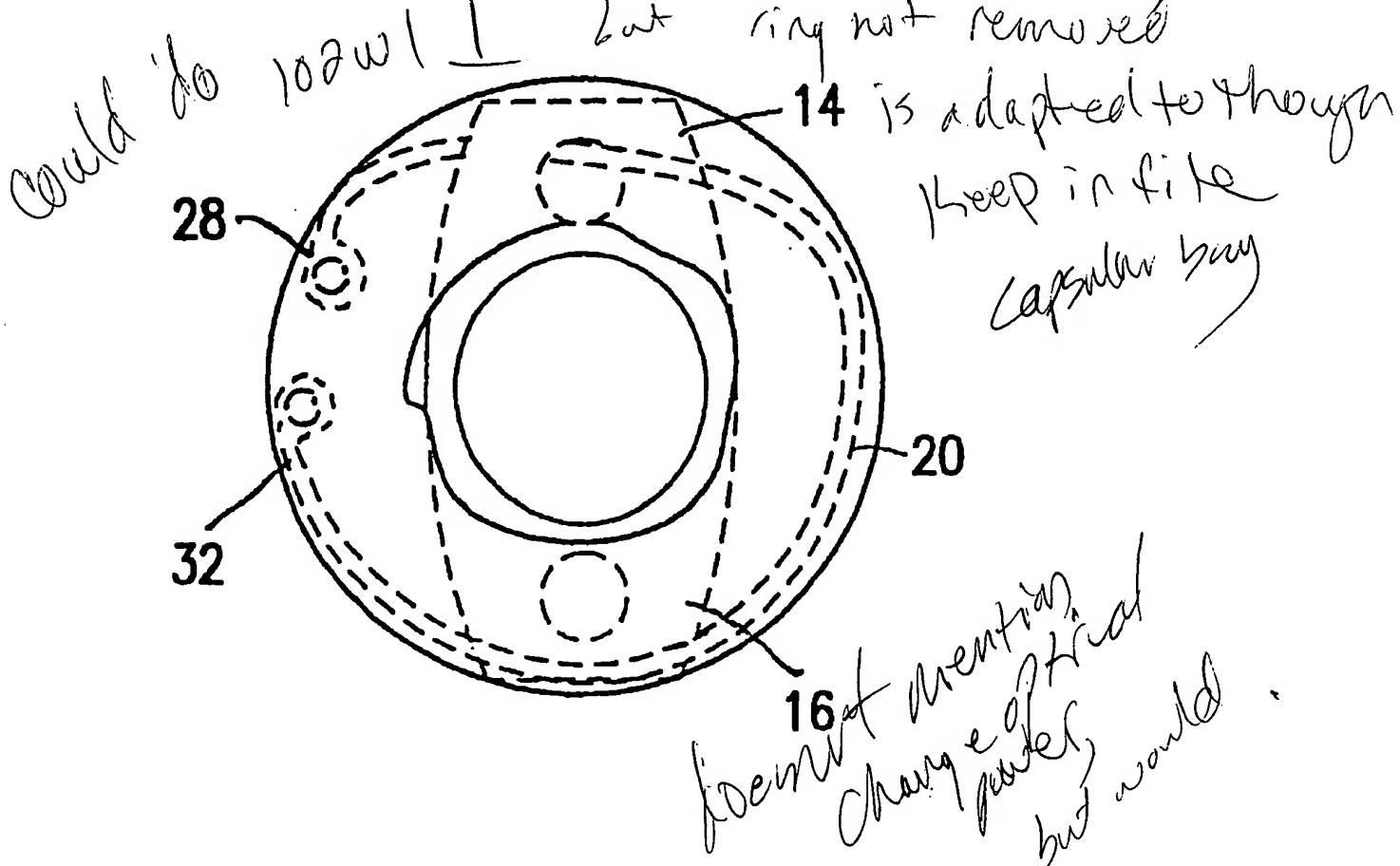
Assistant Examiner—Will H Matthews

(74) Attorney, Agent, or Firm—Sam Silverberg

(57) ABSTRACT

An improved method of inserting an intraocular lens into an eye comprising removing an existing lens so as to leave a capsular bag intact; at least partially inserting an intraocular lens having at least one haptic incorporating an aperture therein into the capsular bag; and inserting a capsular tension ring into the capsular bag such that the capsular tension ring passes through the aperture is disclosed. A replacement lens arrangement and a sterile packaging therefore are also disclosed.

14 Claims, 4 Drawing Sheets



Cite



US 2002013328A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2002/013328 A1  
Sarver (43) Pub. Date: Sep. 19, 2002

(54) ADJUSTABLE INTRAOCULAR LENS

Related U.S. Application Data

(76) Inventor: Edwin J. Sarver, Merritt Island, FL  
(US)

(60) Provisional application No. 60/275,220, filed on Mar.  
13, 2001, now abandoned.

Correspondence Address:

Michael A. Slavin  
McHale & Slavin, P.A.  
Suite 402  
4440 PGA Boulevard  
Palm Beach Gardens, FL 33410 (US)

(21) Appl. No.: 10/099,204

(22) Filed: Mar. 13, 2002

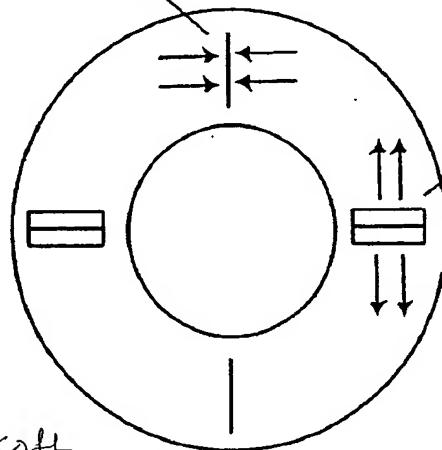
Publication Classification

(51) Int. Cl. 7 ..... A61F 2/16  
(52) U.S. Cl. ..... 623/6.22

(57) ABSTRACT

Improved adjustable intraocular lenses are disclosed, in which the shape of the surface(s) of the lens can be modified post-operatively using manual methods or controlled pulses of laser radiation to achieve improved optical correction.

Closed fissure  
neighborhood  
of high optical  
power



Opened fissure  
neighborhood of  
low optical power

soft  
lens fluid

Cite

Maybe  
use

w 1 | 33, 34

102/03  
~~102~~

Opened



doesn't say soft surface

Closed



doesn't say bag  
but inherently will accommodate

citr



US 20030060878A1

07 w/ 1  
1, 7, 9, 10  
12, 18  
22  
23, 34

(19) United States

(12) Patent Application Publication  
Shadduck(10) Pub. No.: US 2003/0060878 A1  
(43) Pub. Date: Mar. 27, 2003

## (54) INTRAOCULAR LENS SYSTEM AND METHOD FOR POWER ADJUSTMENT

(76) Inventor: John H. Shadduck, Tiburon, CA (US)

Correspondence Address:  
John H. Shadduck  
1490 Vistazo West  
Tiburon, CA 94920 (US)

(21) Appl. No.: 10/231,433

(22) Filed: Aug. 29, 2002

## Related U.S. Application Data

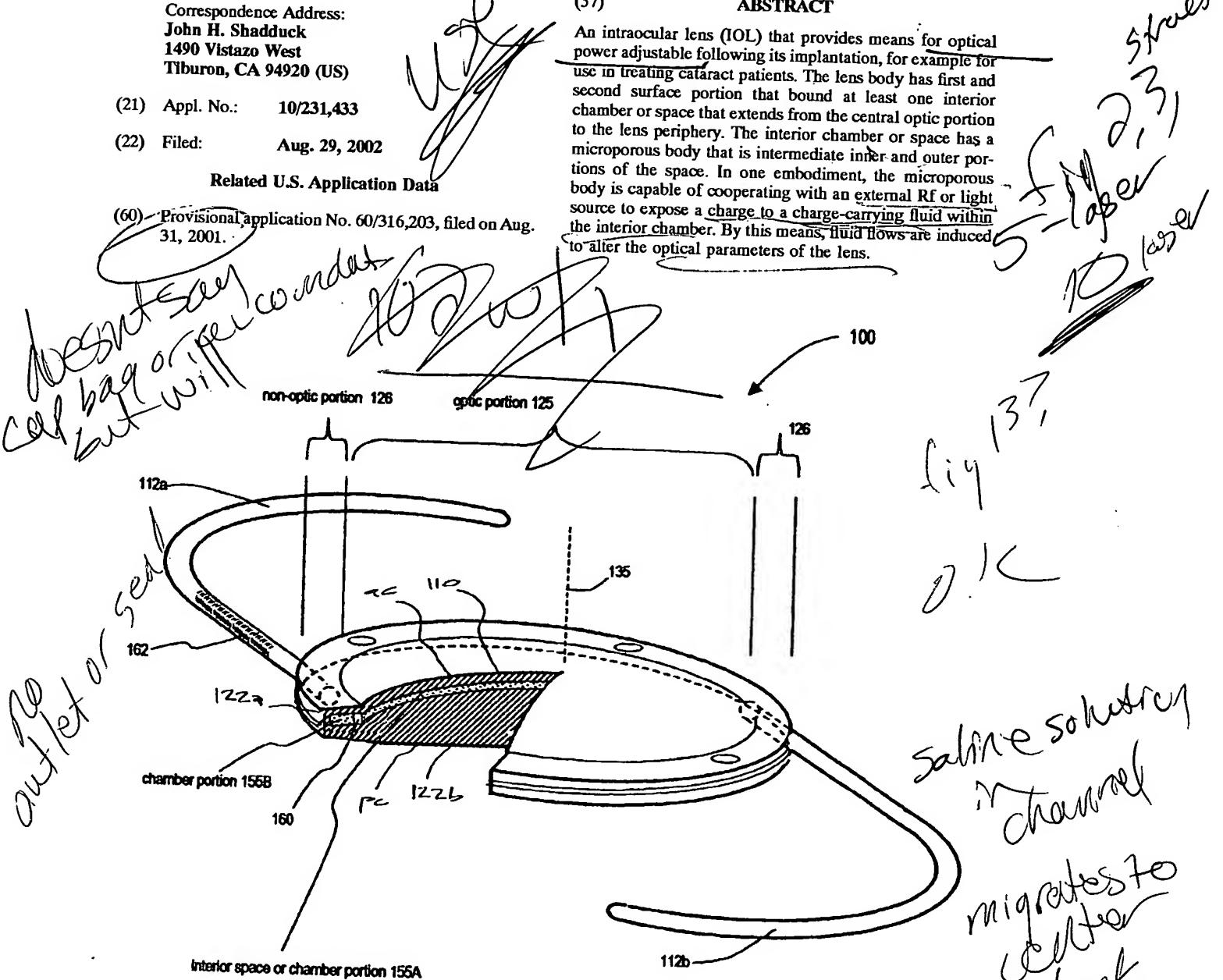
(60) Provisional application No. 60/316,203, filed on Aug. 31, 2001.

## Publication Classification

(51) Int. Cl. 7 ..... A61F 2/16  
(52) U.S. Cl. ..... 623/6.13; 623/6.56

## (57) ABSTRACT

An intraocular lens (IOL) that provides means for optical power adjustable following its implantation, for example for use in treating cataract patients. The lens body has first and second surface portion that bound at least one interior chamber or space that extends from the central optic portion to the lens periphery. The interior chamber or space has a microporous body that is intermediate inner and outer portions of the space. In one embodiment, the microporous body is capable of cooperating with an external RF or light source to expose a charge to a charge-carrying fluid within the interior chamber. By this means, fluid flows are induced to alter the optical parameters of the lens.



stressed fig 7 - fig 3  
non stressed fluid removes from periphery into center increasing power

laser can move it - fig 5